10-16-00

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PTO/SB/05 (08-00)
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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	2000 009
First Inventor	Dobbertin
Title	Pulsed Arknife Control for Vacuum ...
Express Mail Label No.	EL039888834US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

1. ☒ Fee Transmittal Form (e.g., PTO/SB/17) *(Submit an original and a duplicate for fee processing)*
2. ☐ Applicant claims small entity status. See 37 CFR 1.27.
3. ☒ Specification [Total Pages 9]
   (preferred arrangement set forth below)
   - Descriptive title of the invention
   - Cross Reference to Related Applications
   - Statement Regarding Fed sponsored R & D
   - Reference to sequence listing, a table, or a computer program listing appendix
   - Background of the Invention
   - Brief Summary of the Invention
   - Brief Description of the Drawings *(if filed)*
   - Detailed Description
   - Claim(s)
   - Abstract of the Disclosure
4. ☒ Drawing(s) *(35 U.S.C. 113)* [Total Sheets 5]
5. Oath or Declaration [Total Pages 1]
   a. ☒ Newly executed (original or copy)
   b. ☐ Copy from a prior application (37 CFR 1.63 (d)) *(for continuation/divisional with Box 17 completed)*
   i. ☐ DELETION OF INVENTOR(S)
   Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. ☐ Application Data Sheet. See 37 CFR 1.76
7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program *(Appendix)*
8. Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all necessary)*
   a. ☐ Computer Readable Form (CRF)
   b. Specification Sequence Listing on:
      i. ☐ CD-ROM or CD-R (2 copies); or
      ii. ☐ paper
   c. ☐ Statements verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

9. ☒ Assignment Papers (cover sheet & document(s))
10. ☐ 37 CFR 3.73(b) Statement *(when there is an assignee)* ☒ Power of Attorney
11. ☐ English Translation Document *(if applicable)*
12. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
13. ☐ Preliminary Amendment
14. ☒ Return Receipt Postcard (MPEP 503) *(Should be specifically itemized)*
15. ☐ Certified Copy of Priority Document(s) *(if foreign priority is claimed)*
16. ☐ Other: .....

17. If a CONTINUING APPLICATION, *check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:*

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No. _____/_____

Prior application information: *Examiner* _____ *Group / Art Unit:* _____

For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

18. CORRESPONDENCE ADDRESS

☐ *Customer Number or Bar Code Label* *(Insert Customer No. or Attach bar code label here)* or ☒ *Correspondence address below*

Name	Kathleen K Bowen				
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City	Cuyahoga Falls	State	OH	Zip Code	44223
Country	U.S.A.	Telephone	330945 6931	Fax	330945 6931

Name (Print/Type)	Kathleen K Bowen	Registration No. (Attorney/Agent)	42,352
Signature	Kathleen Bowen	Date	10/13/2000

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FEE TRANSMITTAL for FY 2001

Patent fees are subject to annual revision.

TOTAL AMOUNT OF PAYMENT ($) 750.00

Complete if Known	
Application Number	
Filing Date	10/14/2000
First Named Inventor	Dobbertin
Examiner Name	
Group Art Unit	
Attorney Docket No.	2000209

METHOD OF PAYMENT

1. [X] The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:
   - Deposit Account Number: 501381
   - Deposit Account Name: Heidelber Digital LLC
   - [ ] Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17
   - [ ] Applicant claims small entity status See 37 CFR 1.27
2. [ ] **Payment Enclosed:** [ ] Check [ ] Credit card [ ] Money Order [ ] Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
101	710	201	355	Utility filing fee	710
106	320	206	160	Design filing fee	
107	490	207	245	Plant filing fee	
108	710	208	355	Reissue filing fee	
114	150	214	75	Provisional filing fee	

SUBTOTAL (1) ($) 710.00

2. EXTRA CLAIM FEES

		Extra Claims		Fee from below	Fee Paid
Total Claims	5	-20** =	—	X	= —
Independent Claims	2	- 3** =	—	X	= —
Multiple Dependent					= —

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
103	18	203	9	Claims in excess of 20
102	80	202	40	Independent claims in excess of 3
104	270	204	135	Multiple dependent claim, if not paid
109	80	209	40	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) —

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for *ex parte* reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	390	216	195	Extension for reply within second month	
117	890	217	445	Extension for reply within third month	
118	1,390	218	695	Extension for reply within fourth month	
128	1,890	228	945	Extension for reply within fifth month	
119	310	219	155	Notice of Appeal	
120	310	220	155	Filing a brief in support of an appeal	
121	270	221	135	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive - unavoidable	
141	1,240	241	620	Petition to revive - unintentional	
142	1,240	242	620	Utility issue fee (or reissue)	
143	440	243	220	Design issue fee	
144	600	244	300	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Petitions related to provisional applications	
126	240	126	240	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	40
146	710	246	355	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	710	249	355	For each additional invention to be examined (37 CFR § 1.129(b))	
179	710	279	355	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 40.00

SUBMITTED BY

Name (Print/Type)	Kathleen K Bowen	Registration No. (Attorney/Agent)	42,352	Telephone	330 945 6931
Signature	Kathleen K Bowen			Date	10/13/2000

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

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Docket No.2000009

APPLICATION FOR UNITED STATES PATENT

PULSED AIRKNIFE CONTROL FOR A VACUUM CORRUGATED FEED SUPPLY

INVENTORS: Michael T. Dobbertin

Henry P. Mitchell, Jr.

DATE : October 14, 2000

PULSED AIRKNIFE CONTROL
FOR A VACUUM CORRUGATED FEED SUPPLY

BACKGROUND

The present invention is in the field of printers and copiers. More specifically this invention relates to a receiver sheet supply and feed apparatus, including a vacuum corrugated feeder, and a positive air pressure separator on such printers and copiers. This invention is useful for the apparatus described by the US Patent # 5,344,133 "Vacuum belt feeder having a positive air pressure separator and method of using a vacuum belt feeder " by Jantsch et al, which patent is hereby incorporated by reference in its entirety. The incorporated patent refers to a vacuum, a first positive air supply, and a second positive air supply. The first and second positive air supplies are used simultaneously and will herein be referred to collectively as the airknife.

In typical reproduction apparatus such as copiers or printers, information is reproduced on individual cut sheets of receiver material such as plain bond paper or transparencies. Such receiver sheets are stored in a stack and fed individually when copies are to be produced. The sheet feeder for the reproduction apparatus must be able to handle a wide range of sheet types and sizes reliably and without damage. Sheets must be fed individually, without misfeeds or multi-feeds.

In the vacuum corrugated belt feeder disclosed in the above patent, both the vacuum and the positive air pressure are controlled by valves. During the feed cycle, the positive air pressure valve is continuously open. The vacuum valve is opened to acquire the top sheet off the stack. After approximately 220 milliseconds (for a 110 pages per minute (ppm) feed rate), the clutch is actuated, which drives the feed belts to advance the sheet into the constantly rotating take away rollers. At a time after the lead edge of the sheet has reached the take away rollers, prior to the trail edge of the sheet reaching the edge of the ports in the vacuum plenum, the vacuum and the clutch are turned off.

The airknife airflow and velocity during the acquisition phase must be great enough to fluff the stack and pre-separate the top sheet. During the transport phase, the flow from the airknife must be high enough to create the air bearing between the sheet being fed, and the rest of the stack. However, flow that is too high during the transport phase has several undesirable effects. For example, if the flow is too high there is an increased tendency for the sheets below the top sheet to be blown back away from the lead edge. This is especially troublesome for sheets that do not have a continuous trail edge. Also, the air can deflect the lead edge of sheets with low stiffness, especially if the paper curl is down (lead edge away from the feed belts), which can lead to paper damage or jamming. The flow must not be so great as to levitate any sheets below the sheet being fed above the mechanical gate fingers along the lead edge of the paper drawer, or high enough to cause the second sheet to contact the top sheet when it is being transported off the stack. Also, if the flow is too great, it can cause the trail edge of the sheet being fed to flutter violently, which can in turn contact the sheet below it, tending to drive it forward also.

Typically, the minimum airflow of the airknife is dictated by the acquisition and separation needs and the maximum airflow of the airknife is limited by the transport phase. A method of operation is desired which will optimize the usefulness of the airknife during the acquisition and separation phase, while minimizing the detriments of the airknife during the transport phase.

SUMMARY OF THE INVENTION

A method of operating a vacuum corrugated belt feeder with positive air pressure separator during a feed cycle wherein the vacuum and the positive pressure air are controlled by a vacuum valve and a positive air pressure valve respectively, wherein the paper is taken away by a belt which is activated when a feed clutch is energized, comprising actuating the vacuum at the start of the feed cycle and de-actuating the vacuum when the feed clutch is de-energized, and pulsing the positive air pressure separator by actuating and de-actuating the positive air pressure separator during the feed cycle.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a side view of a receiver sheet supply and feeding apparatus.

FIGURE 2 is a top plan view of a receiver sheet supply and feeding apparatus of Fig 1 with portions removed or broken away to facilitate viewing

FIGURE 3 is a side view of a cross-section of a receiver sheet supply and feeding apparatus taken along lines 3—3 of Fig. 2.

FIGURE 4 is a side cross-sectional view of a portion of a receiver sheet supply and feeding apparatus,

FIGURE 5 is an end view of a portion of the receiver sheet supply and feeding apparatus, taken along the lines 5—5 of Fig. 3.

FIGURE 6 is an end view of a portion of the receiver sheet supply and feeding apparatus, taken along the lines 6—6 of Fig. 3.

DETAILED DESCRIPTION

The US Patent # 5,344,133 "Vacuum belt feeder having a positive air pressure separator and method of using a vacuum belt feeder " by Jantsch et al, describes an apparatus which uses both vacuum and positive pressure air pressure to separate and acquire the top sheet of a supply stack. In this invention, both the vacuum line and the positive air pressure line are routed through valves, which valves are used to control the flow of vacuum and positive air. During typical operation of a printer/copier which uses the apparatus described in US Patent # 5,344,133, both the vacuum valve and the positive air pressure valve are open during the feed cycle, and closed when the printer/copier is not feeding from that particular supply.

Following is a detailed description of the drawings which show the vacuum belt feeder with positive air pressure separator as described in US Patent # 5,344,133. Although this system is described in detail, the present invention is not limited to use in this particular system. Any printer/copier which uses a combination of vacuum and positive air pressure to lift and separate the top sheets from a feed stack may make use of this invention.

The detailed description is written to a top feed vacuum corrugated feed device, but the present invention is also useful for a bottom feed vacuum belt feed device. In the case of a bottom feed device, instead of separating the top sheet, the vacuum with the airknife would be separating the bottom sheet.

Various aspects of the invention are presented in Figures 1-6 which are not drawn to scale and in which like components are numbered alike. Referring now to Figures 1-2, a receiver sheet supply and feeding apparatus are shown. The receiver sheet supply and feeding apparatus designated generally by the numeral **10**, includes an open hopper **12** and an elevating platform **14** for supporting a stack of sheets. A sheet stack **15** supported on the platform 14 contains individual sheets suitable for serving as receiver sheets for having reproductions formed thereon in a copier or printer device.

The sheet stack-supporting platform **14** is supported within the hopper **12** for substantially vertical elevational movement by a lifting mechanism. The lifting mechanism serves to raise the platform **14** to an elevation for maintaining the topmost sheet in the stack at a predetermined level during operation. Maintaining the topmost sheet at the predetermined level is accomplished by a sheet detection switch **80** (see Fig 5), or multiple switches, which controls the operation of a motor for actuating the lifting mechanism to raise the platform until a switch or switches is activated.

A sheet feed head assembly **30** is located in association with the hopper **12** so as to extend over a portion of the platform **14** in spaced relation to a sheet stack **15** supported thereon. The sheet feed head assembly **30** includes a ported plenum **32** connected to a vacuum source **31** through a vacuum valve **38,** and an airknife **40** connected to a positive pressure air source **41** through a positive pressure valve **60.** A positive pressure airjet from the airknife **40** levitates the top sheets in the supported sheet stack **15**. Vacuum at the plenum **32** is effective through the plenum ports **33** to cause the topmost levitated sheet from the stack to thereafter be acquired at the plenum **32** for separation from the sheet stack **15.** Additional positive air pressure jets from the airknife **40** assure separation of subsequent sheets from the acquired topmost sheet.

A vacuum valve **38** (see Fig 5) is used to control the operation of the vacuum and to limit the vacuum level. Thus during a feed cycle, the valve will be open so as to levitate the top sheet in the stack. In a preferred method of operation, the opening and closing of the vacuum valve is timing based, however, valve operation may also be controlled by other methods, such as a pressure or a mechanically activated switch. For example, a switch may be attached to the plenum **32** to detect when a sheet has been acquired. A signal provided by the switch on detection of sheet acquisition may be utilized to control operation of various components of the sheet feed head assembly **30**, such as timing of activations or setting of air flow levels, to optimize operation for a particular type (size) of sheet to be fed from the sheet supply and feeding mechanism **10.** When the vacuum is said to be "actuated", this means that the vacuum valve **38** is open. When the vacuum is said to be "de-actuated" this means that the vacuum valve **38** is closed.

The belts **36** are selectively driven by energizing a feed clutch (not shown), in a direction to remove the acquired sheet from the area above the sheet stack **15** and transport the sheet in the feed direction along a travel path to a downstream transport, such as a driven feed nip roller pair **50.** The nip roller pair **50** is driven by a motor. A gear **52** is rotatably mounted on a shaft (not shown) supporting one roller of the nip roller pair **50.** A clutch **56** is selectively activated to couple the gear **52** to the shaft **54** for rotation with the shaft. An intermediate gear **58** is in mesh with the gear **52** and a gear (not shown) coupled to one of the belt rollers **39.** Accordingly when the clutch **56** is engaged, the belts **36** will be driven so as to feed an acquired sheet such that the acquired sheet is transported from the sheet stack **15** and is thereafter available for any further processing, such as receiving a reproduction from a copier or printer.

The airknife **40** comprises a first air jet arrangement **42** and a second air jet arrangement **44.** The first air jet arrangement incorporates a single nozzle **43** in fluid communication with a source of positive pressure air **41**, for example a range of 4-10 inwg in certain embodiments. The chambers which are part of the first air jet arrangement **42** and the second air jet arrangement **44** may be

separate chambers, or may be combined into one larger chamber. The nozzle **43** directs a positive pressure air stream at the sheet stack, in the center of the lead edge, to fluff the top sheets in the stack to bring the topmost sheet into association with the sheet feed head assembly **30** where it can be acquired by vacuum, at the plenum **32**.

The second air jet arrangement **44** incorporates a plurality of nozzles **46** fluid communication with the source of positive pressure air **41**. The nozzles **46** are aimed slightly downstream of the aimpoint for the first air jet nozzle **43**. The purpose of the second air jet arrangement **44** is to separate any sheets adhering to the topmost sheet acquired by the sheet feed head assembly **30**.

A positive pressure air valve **60** is used to control the flow of positive pressure air through the airknife **40**. When the positive air pressure separator **40** is actuated, this means the positive air pressure valve **60** is open. When the positive air pressure separator **40** is de-actuated, this means the positive air pressure valve **60** is closed. However, when the positive air pressure valve **60** is closed, that does not necessarily mean that there is no positive pressure airflow. In a preferred design, the positive air pressure valve **60** allows some airflow even when closed (does not close all the way). One commonly used valve design allows about one third of the airflow through an open valve to flow through when the valve is 'closed'.

Common practice for operation of a vacuum corrugated belt feeder with positive air pressure separator during a feed cycle, is to actuate the vacuum valve **38** and the positive air pressure separator **40** at the start of the feed cycle and de-actuated the vacuum valve **38** when the feed clutch is de-energized, but leave the positive air pressure separator **40** actuated throughout the feed cycle.

According to an aspect of the invention, this method is improved upon by pulsing the positive air pressure separator **40** by actuating and de-actuating the positive air pressure separator **40** during the feed cycle.

In a preferred embodiment of the invention, the positive air pressure separator **40** is actuated when the vacuum is actuated, and de-actuated before the feed clutch is energized. According to this aspect of the invention, the

positive air pressure separator is actuated during the acquisition phase, and de-actuated during the transport phase.

In a further preferred embodiment, the positive air pressure separator **40** is actuated when the vacuum is actuated, and is de-actuated approximately 50 milliseconds before the feed clutch is energized. This time may be optimized for different operating feed rates, for example it may need to be less for higher speed feeds. By pulsing the positive air pressure separator **40**, the high pressure achieved may be higher, and the low pressure (flow when the positive air pressure valve **60** is 'closed') may be lower. This means that during the acquisition phase, when the high pressure is needed to separate the sheets, higher pressure is available. During the transport phase, when higher pressure causes problems, the pressure is lower because the positive air pressure separator **40** is de-actuated. This allows the receiver sheet supply and feeding apparatus **10** to function better for heavier papers, due to the higher pressure during acquisition. It also allows the receiver sheet supply and feeding apparatus **10** to work better for lighter papers, due to the lower pressure during transport. Thus this invention opens the operating window of the receiver sheet supply and feeding apparatus **10.** This control may allow the high air level to increase as much as by a factor of two without significantly impacting feed performance on light paper.

Also, on copiers/printers with multiple sheet supplies, this invention enables a smaller blower to do the same job because the positive air pressure separator **40** is not actuated throughout the feed cycle.

According to an aspect of the invention, a method of operating a vacuum corrugated belt feeder with positive air pressure separator during a feed cycle comprises opening the vacuum valve **38** and the positive pressure air valve **60,** closing the positive pressure air valve **60,** energizing the feed clutch on the belt feeder, de-energizing the feed clutch, and closing the vacuum valve **38.**

What is claimed is:

1. In a method of operating a vacuum corrugated belt feeder with positive air pressure separator during a feed cycle wherein said vacuum and said positive pressure air are controlled by a vacuum valve and a positive air pressure valve respectively, wherein the paper is taken away by a belt which is activated when a feed clutch is energized, wherein the vacuum is actuated at the start of the feed cycle and de-actuated when the feed clutch is de-energized, the improvement comprising:

pulsing the positive air pressure separator by actuating and de-actuating said positive air pressure separator during the feed cycle.

2. The method of claim 1 wherein said positive air pressure separator is actuated when said vacuum is actuated, and said positive air pressure is de-actuated before the feed clutch is energized.

3. The method of claim 1 when the feed rate is 110 pages per minute, wherein said positive air pressure separator is actuated when said vacuum is actuated, and said positive air pressure is de-actuated approximately 50 milliseconds before the feed clutch is energized.

4. The method of claim 1 when the feed rate is 110 pages per minute, wherein said positive air pressure valve is closed approximately 50 milliseconds prior to the clutch being energized.

5. A method of operating a vacuum corrugated belt feeder with positive air pressure separator during a feed cycle wherein said vacuum and said positive pressure air are controlled by a vacuum valve and a positive air pressure valve respectively, wherein the paper is taken away by a belt which is activated when a feed clutch is energized, comprising:

opening said vacuum valve and said positive pressure air valve;

closing said positive pressure air valve;

energizing the feed clutch on the belt feeder;

de-energizing the feed clutch ; and,

closing said vacuum valve.

ABSTRACT

A method of operating a vacuum corrugated belt feeder with positive air pressure separator during a feed cycle wherein the vacuum and the positive pressure air are controlled by a vacuum valve and a positive air pressure valve respectively, wherein the paper is taken away by a belt which is activated when a feed clutch is energized, comprising actuating the vacuum at the start of the feed cycle and de-actuated the vacuum when the feed clutch is de-energized, and pulsing the positive air pressure separator by actuating and de-actuating the positive air pressure separator during the feed cycle.

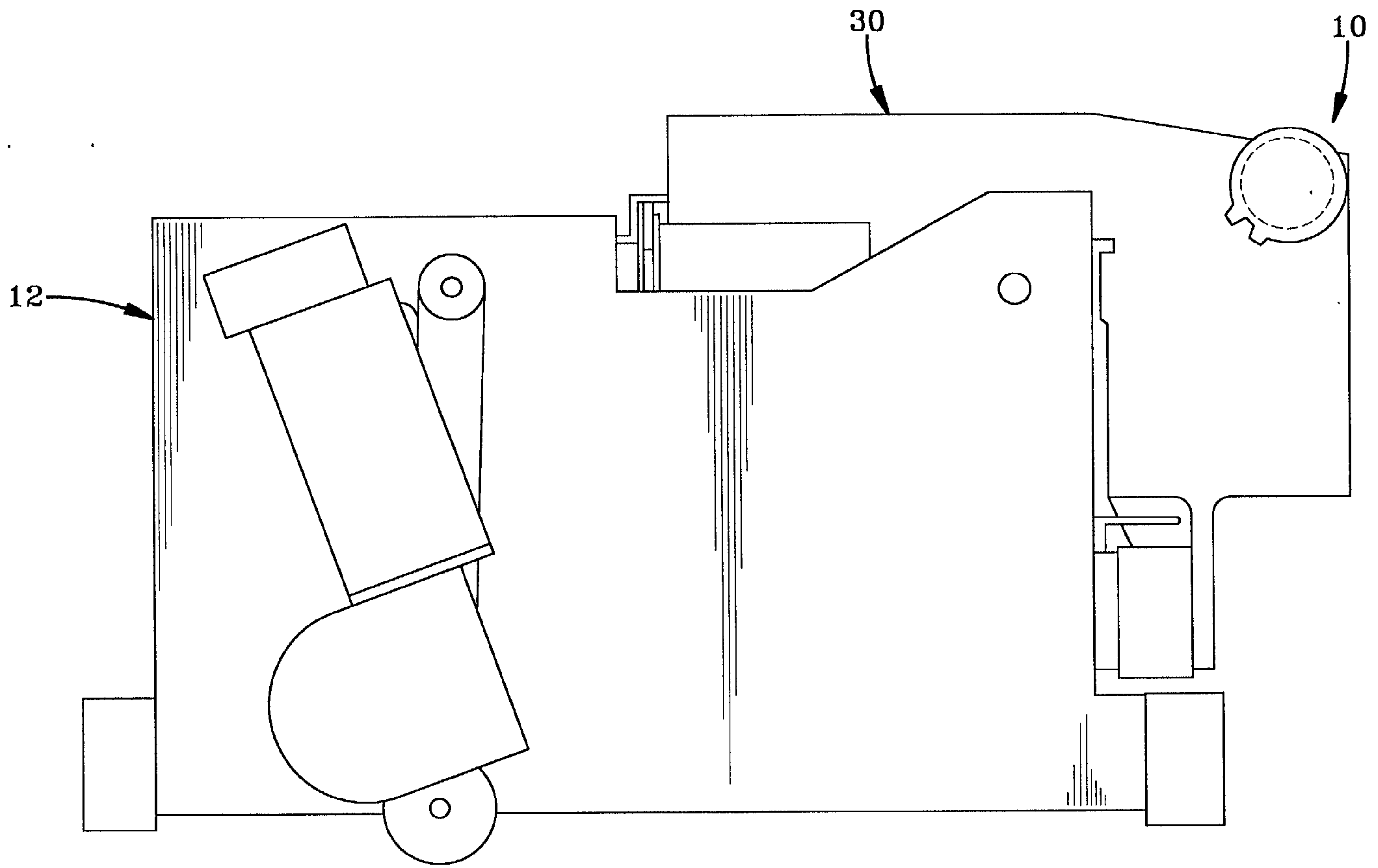


FIG-1

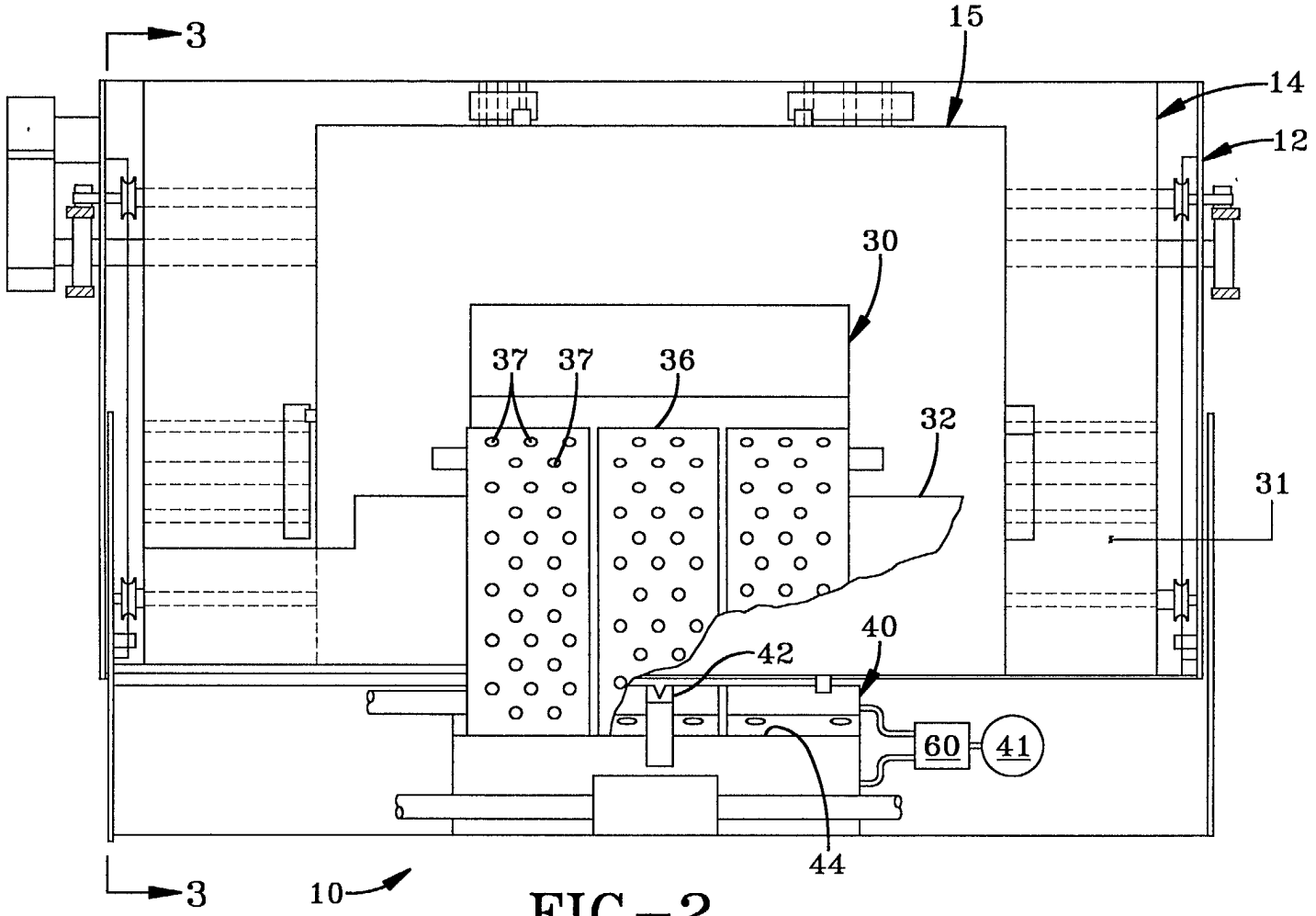


FIG-2

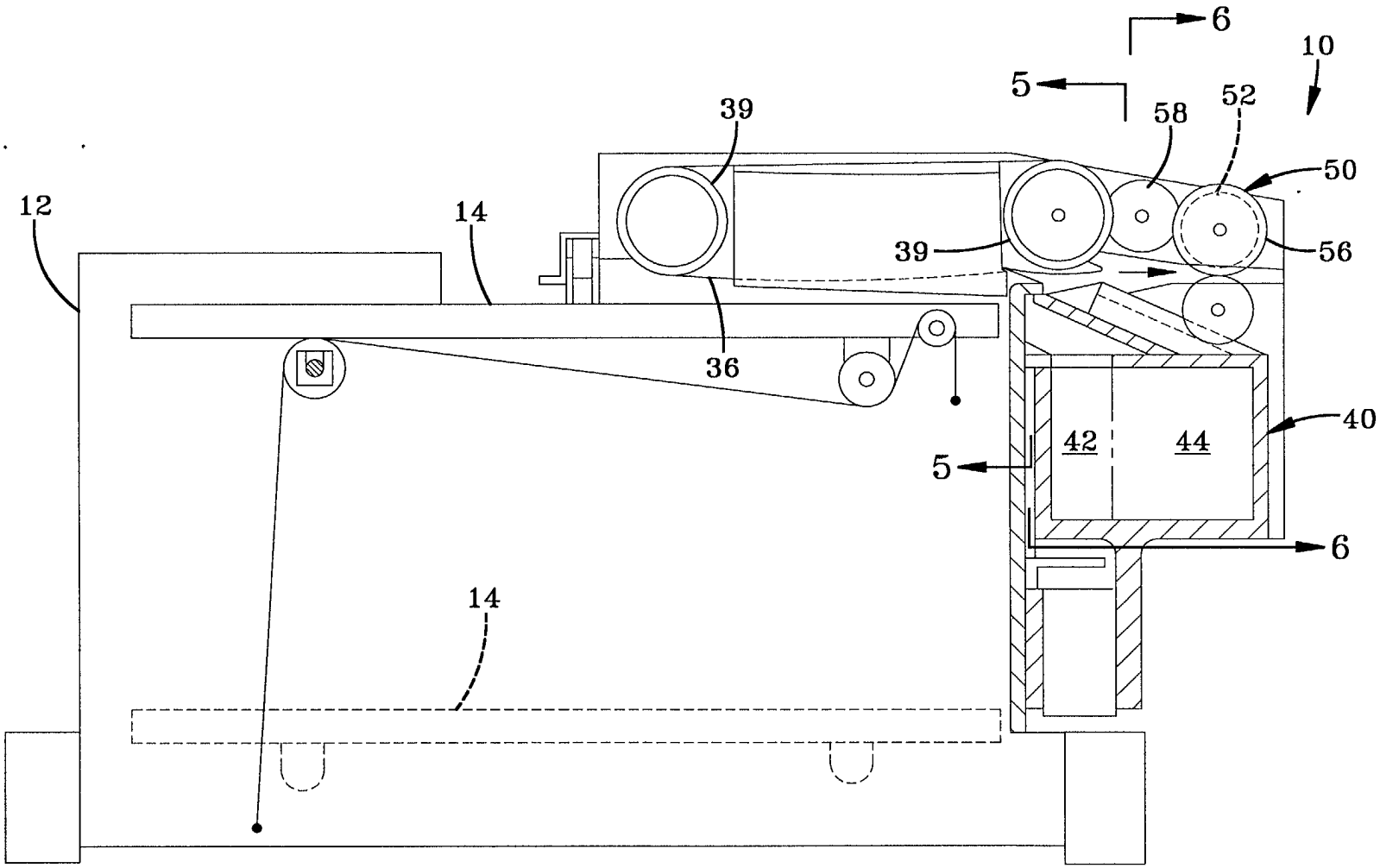


FIG-3

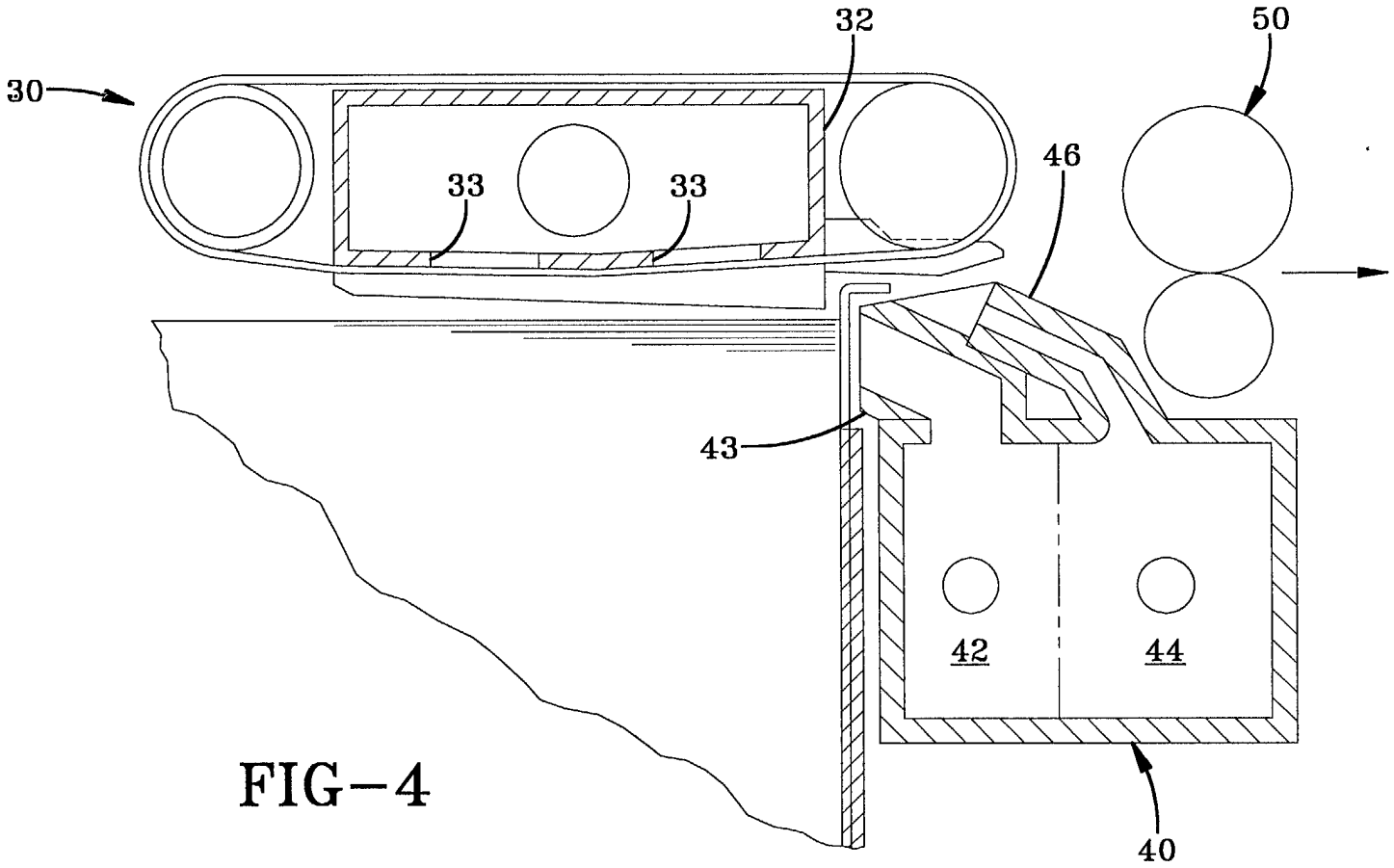
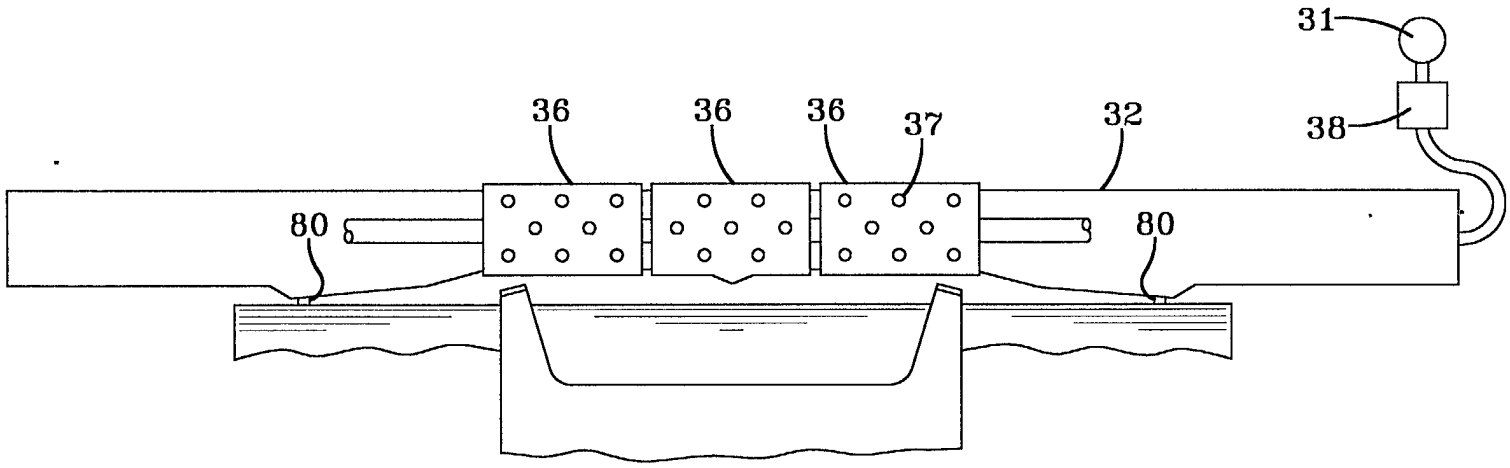
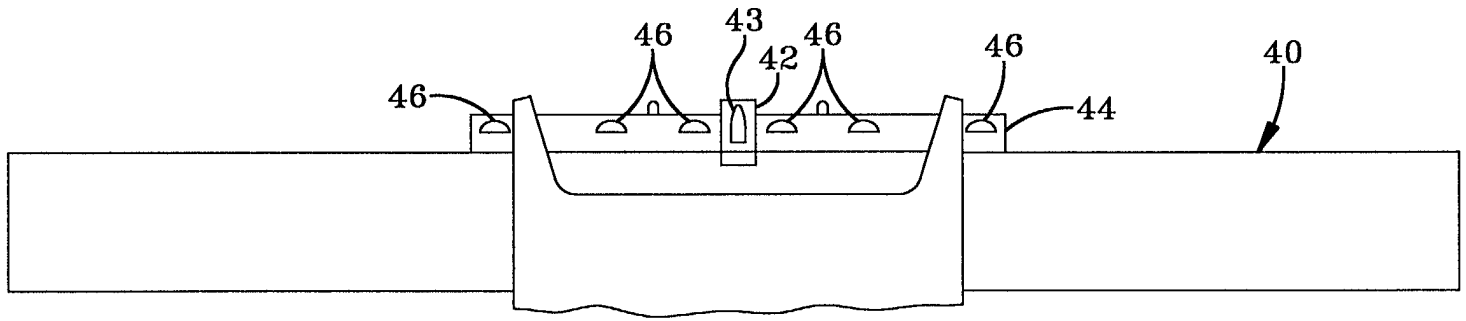


FIG-4



FIG–5



FIG–6

Case No. 10072

DECLARATION FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled Pulsed Airknife Control For Vacuum Corrugated Feed Supply, the specification of which:

- ☒ is attached hereto.
- ☐ was filed on _____ as Application Serial No. _____.
- ☐ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability as defined in Title 37, Code of Federal Regulations, § 1.56(a).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Inventor's Signature	Michael T Dobbertin	Date:	10/12/00
Full name of sole or first inventor	Michael T. Dobbertin		
Residence	Honeoye, NY 14471		
Citizenship	United States		
Post Office Address	292 East Lake Rd.		

Inventor's Signature	Henry P Mitchell Jr	Date:	10/12/2000
Full name of second joint inventor, if any	Henry P. Mitchell, Jr		
Residence	Webster, NY 14580		
Citizenship	United States		
Post Office Address	497 Sherborne Rd		

Case No. 10072

Inventor(s): Michael T. Dobbertin, Henry P. Mitchell, Jr.

Title: Pulsed Airknife Control For A Vacuum Corrugated Feed Supply

POWER OF ATTORNEY

The specification of the above-identified patent application:

☒ is attached hereto
☐ was filed on _____ as application Serial No. _____

I hereby revoke all previously granted powers of attorney in the above-identified patent application and appoint the following attorneys to prosecute said patent application and to transact all business in the Patent and Trademark Office connected therewith:

James A. Cairns (32,557)
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Kevin L. Leffel (37,379)
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Heidelberg Digital L.L.C., a corporation, certifies that it is the assignee of the entire right, title and interest in the patent application identified above by virtue of either:

☒ An assignment from the inventor(s) of the patent application identified above, a copy of which is attached hereto.
OR

☐ An assignment from the inventor(s) of the patent application identified above. The assignment was recorded in the Patent and Trademark Office at Reel _____, frame _____.
OR

☐ A chain of title from the inventor(s), of the patent application identified above, to the current assignee as shown below:

1. From _____ To:
The document was recorded in the Patent and Trademark Office at
Reel _____, frame _____, or a copy thereof is attached.

2. From _____ To:
The document was recorded in the Patent and Trademark Office at
Reel _____, frame _____, or a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet.

The undersigned has reviewed the assignment or all the documents in the chain of title of the patent application identified above and, to the best of undersigned's knowledge and belief, title is in the assignee identified above.

The undersigned (whose title is supplied below) is empowered to act on behalf of the assignee.

I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further, that these statements are made with the knowledge that willful false statements, and the like so made, are punishable by fine or imprisonment, or both, under Section 1001, Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signature _____ Date: 10/11/00

Name: James A. Garde

Title: Chief Financial Officer